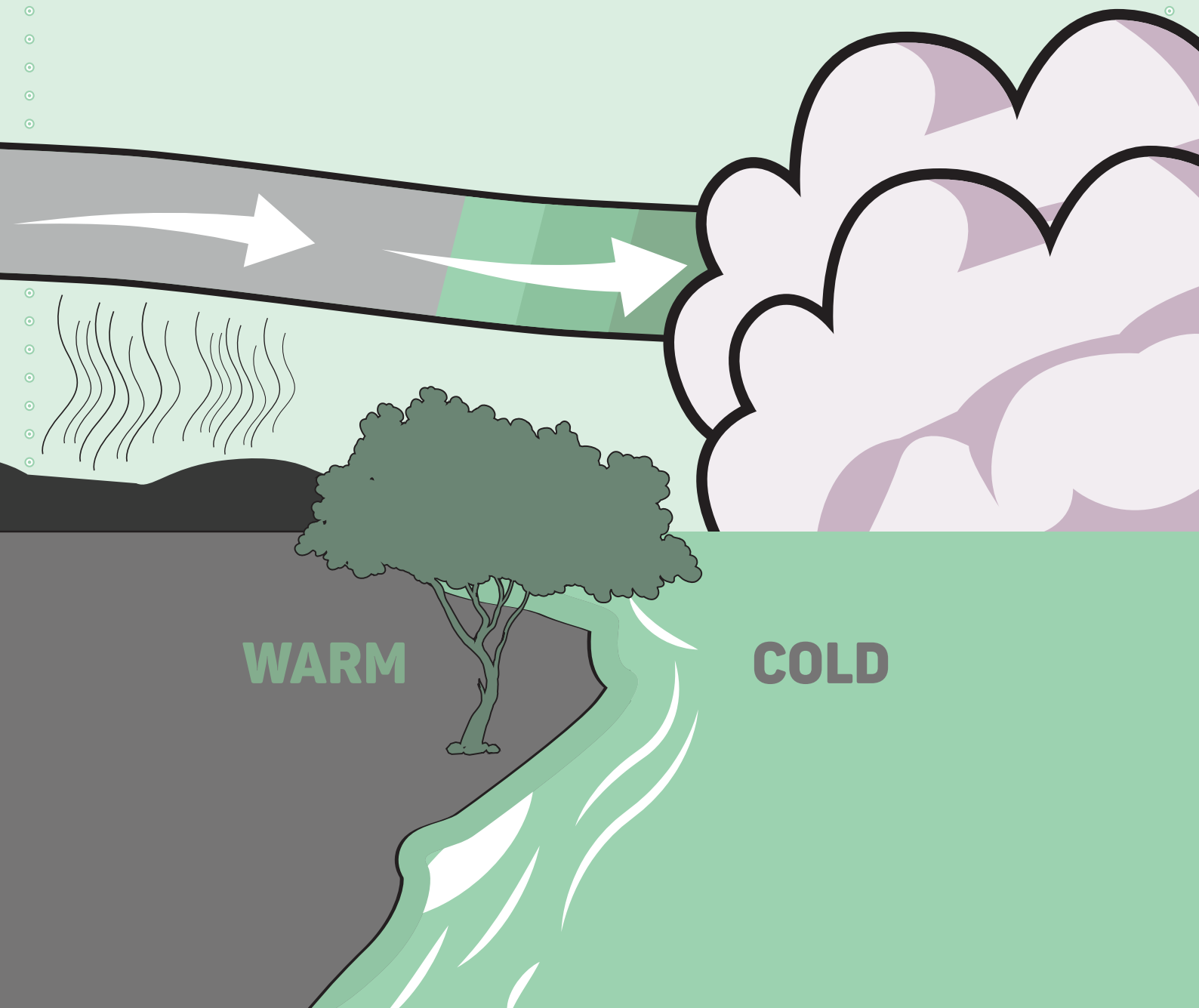


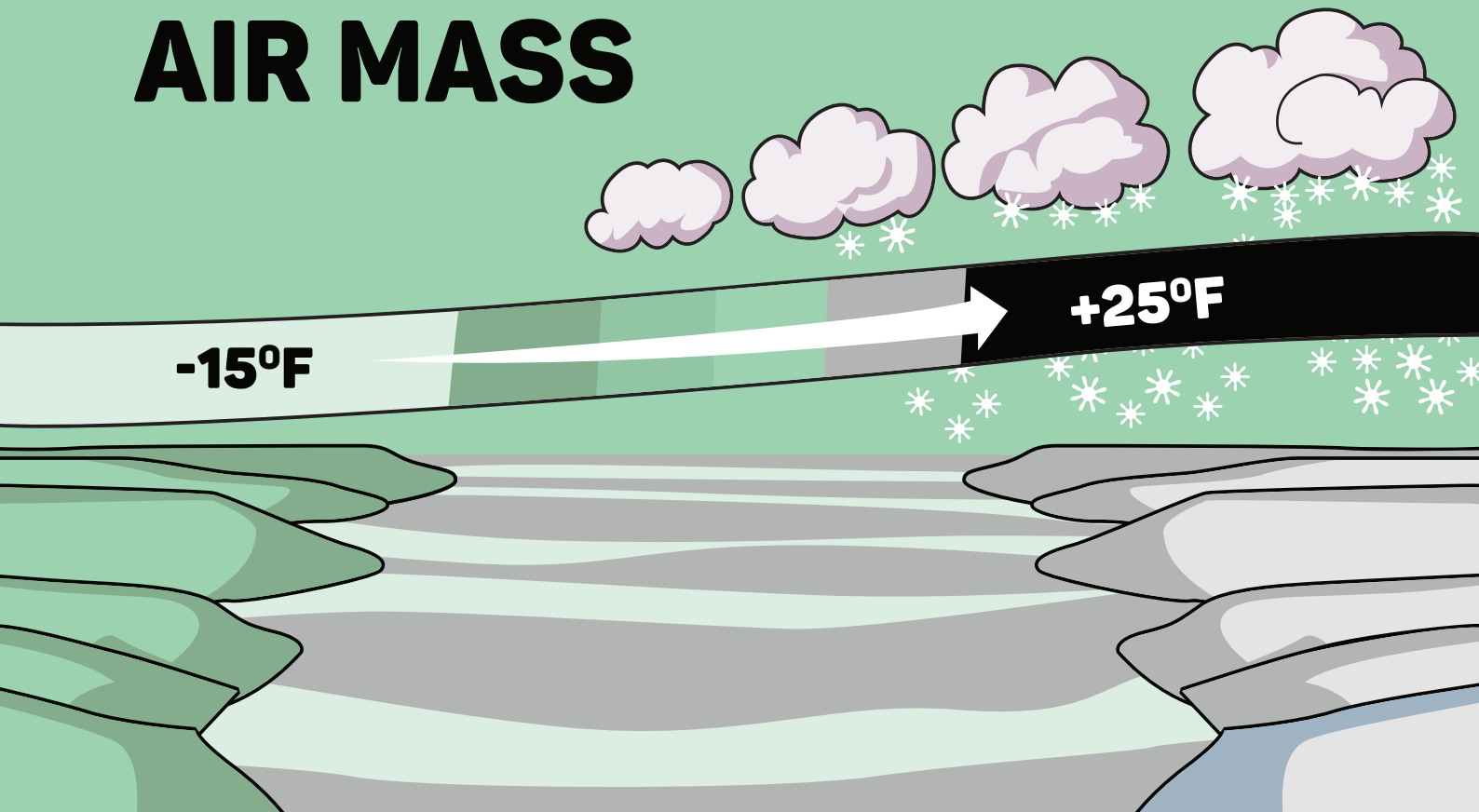


QUICK REVISION MODULE (UPSC PRELIMS 2022)
GEOGRAPHY

AIR MASS



AIR MASS



A large body of air having little horizontal variation in temperature and moisture. The homogenous surfaces, over which air masses form, are called the source regions .

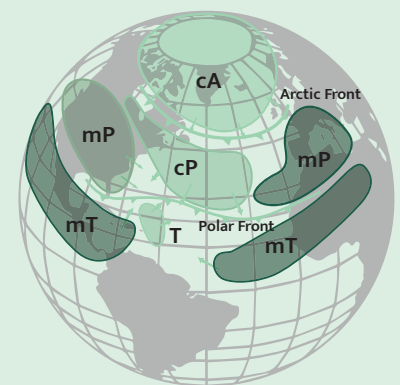
FIVE MAJOR SOURCE REGIONS

1. Warm tropical and subtropical oceans
2. The subtropical hot deserts
3. The relatively cold high latitude oceans
4. The very cold snow covered continents in high latitudes
5. Permanently ice covered continents in the Arctic and Antarctica

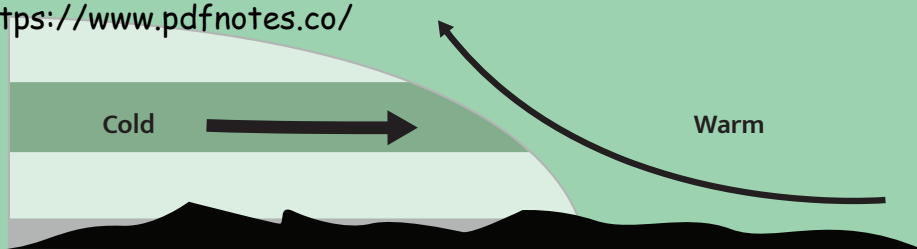
PRIMARY AIR MASSES

1. Maritime tropical (mT)
2. Continental tropical (cT)
3. Maritime polar (mP)
4. Continental polar (cP)
5. Continental arctic (cA)

'm' stands for Maritime;
'c' stands for continental;
'T' stands for tropical;
'P' stands for polar and
'A' stands for arctic region



FRONTS



When two different air masses with distinct properties (temperature, moisture, density, pressure etc.) meet, the boundary zone between them is called a front. The process of formation of the fronts is known as Frontogenesis while Frontolysis is the end stage of a front.

FRONT CAN BE RECOGNIZED WITH FOLLOWING OBSERVATIONS:

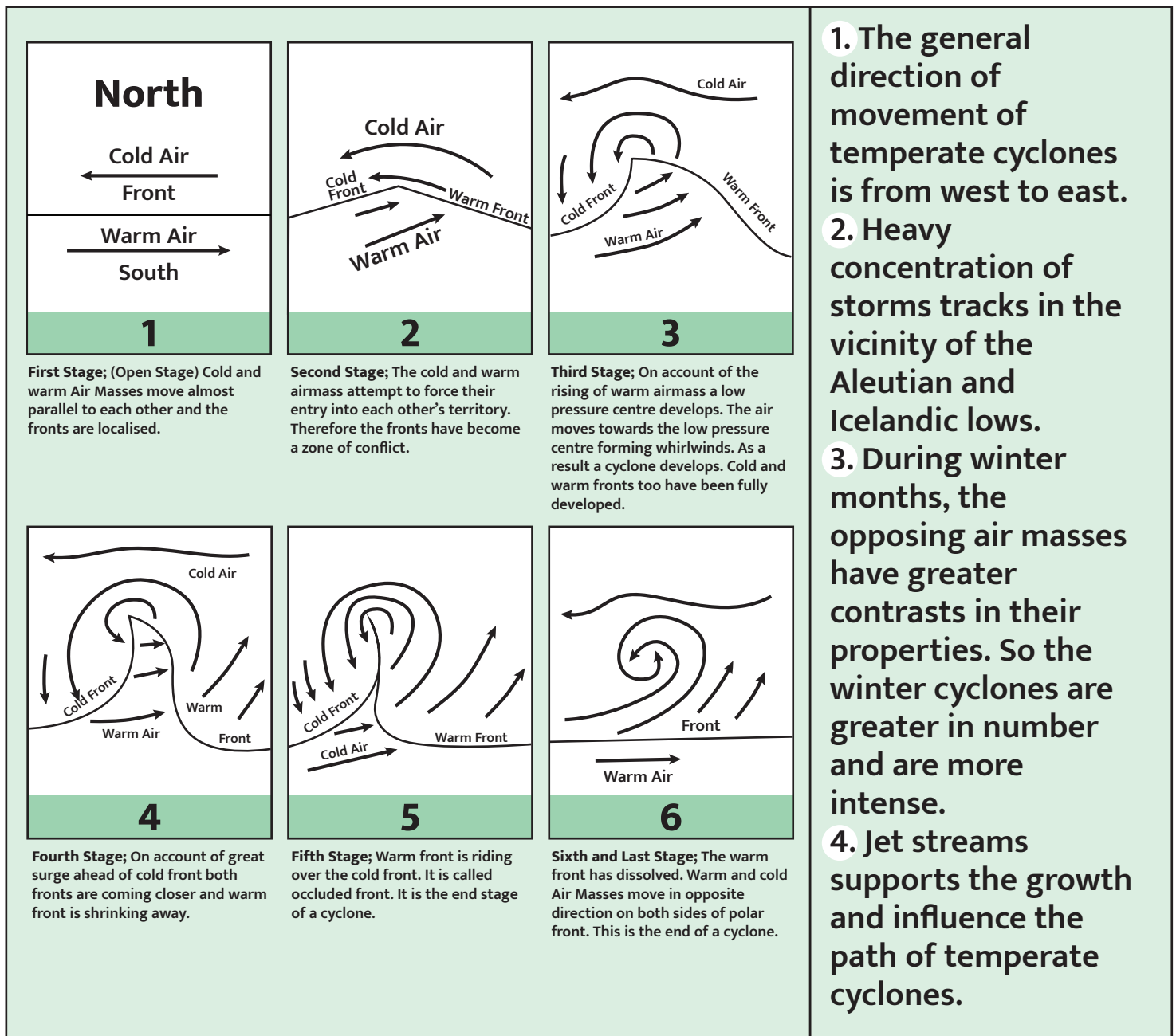
- Sharp temperature changes over a relatively short distance. Sometimes change of 10 degrees to 20 degrees Celsius may be observed.
- Change in moisture content
- Rapid shifts in wind direction
- Pressure changes
- Clouds and precipitation patterns

TYPE OF FRONTS

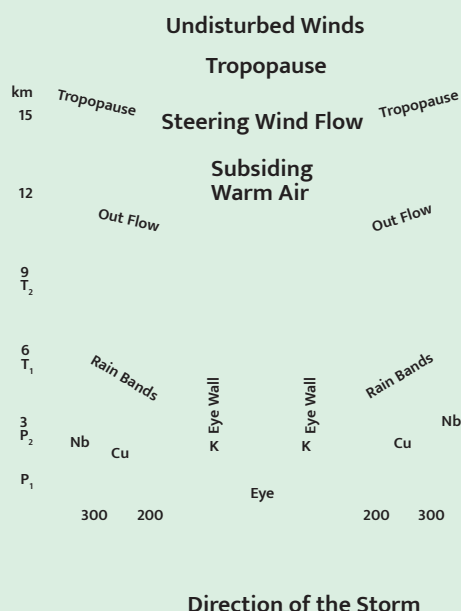
<p>WARM FRONT</p> <p>When a warmer and lighter air mass moves against an existing cold and dense airmass, it rises over the colder and denser air mass. Unlike the cold front, the changes in temperature and wind direction are gradual.</p>	
<p>COLD FRONT</p> <p>When a cold and dense airmass forces its way under warm and lighter airmass it makes the warm and lighter airmass to ride over it. Cold front is much steeper than the warm front.</p>	
<p>STATIONERY FRONT</p> <p>This happens when two masses of air are pushing against each other but neither is powerful enough to move the other. Wind blows parallel to the front.</p>	
<p>OCCCLUDED FRONT</p> <p>At an occluded front, the cold air mass from the cold front meets the cool air that was ahead of the warm front.</p>	

CYCLONES

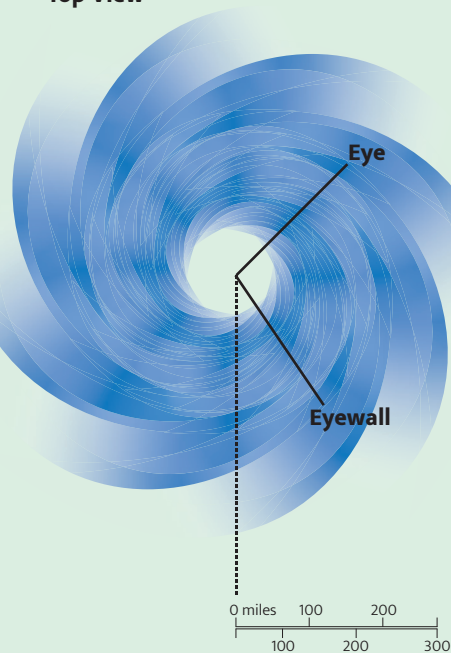
Extra-Tropical cyclone (Temperate cyclone) – These are the weather disturbances in the mid and high latitude, beyond the tropics.



TROPICAL CYCLONE



Top View



The tropical cyclone develops from the 'warm core' of extremely low pressure area in the tropical oceanic areas.

They are energized from condensation process in the towering cumulonimbus clouds, surrounding the centre of the storm.

On reaching the land the moisture supply is cut off and the storm dissipates.

Coriolis force causes cyclonic circulation.

At the equator, the Coriolis force is zero and the wind blows perpendicular to the isobars. The low pressure gets filled instead of getting intensified. That is the reason why tropical cyclones are not formed near the equator.

Because of weak vertical wind shear, cyclone formation processes are limited to latitudes equatorward of the sub-tropical jet stream.

Conditions favourable for the formation and intensification of tropical storms are:

- Large sea surface with temperature higher than 27° C
- Presence of the Coriolis force
- Small variations in the vertical wind
- A pre-existing weak low-pressure area or low-level-cyclonic circulation
- Upper divergence above the sea level system.
- Small variations in the vertical wind speed

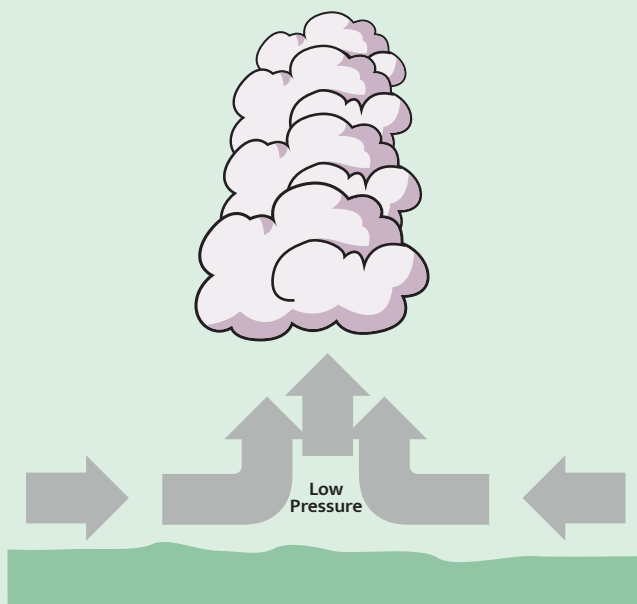
Region	Local Name
Indian Ocean	Cyclone or Chakrvaat
Atlantic	Hurricanes
Western Pacific and South China Sea	Typhoons
Western Australia	Willy-willies

DIFFERENCE BETWEEN EXTRA-TROPICAL AND TROPICAL CYCLONES –

EXTRA-TROPICAL CYCLONE	TROPICAL CYCLONE
Have a clear frontal system and get energy from the horizontal temperature contrasts that exist in the atmosphere	Fronts are not present and get energy from warm and moist air of ocean
Can originate over the land and sea	Originate only over the seas
Travel both on oceans and land	On reaching the land they dissipate.
Affects a much larger area as compared to the tropical cyclone.	Wind velocity in a tropical cyclone is much higher and it is more destructive.
Move from west to east	Move from east to west

THUNDERSTORMS AND TORNADOES

Thunderstorm – A storm accompanied by thunder and lightning is called thunderstorm. It is associated with the cumulonimbus clouds. Thunderstorms are caused by intense convection on moist hot days.



Tornado – From severe thunderstorms sometimes spiraling wind descends like a trunk of an elephant with great force, with very low pressure at the centre causing massive destruction on its way. Such a phenomenon is called a tornado.

